Cyrus

WORLD CLASS CHESS

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Introduction

Cyrus Chess originated from the program that won the second European Microcomputer Chess Championship. Since then, it has been greatly improved.

Cyrus offers the advanced chess player a challenging game under tournament conditions. When instructed to play fast, the program can't "think" as long about its moves and is an ideal opponent for the beginner.

Cyrus is exceptionally versatile. It can play against itself or replay the moves of a finished game. While pondering its next move, it can show you the possibilities it is considering. You may take back moves or set up special positions for problem-solving or analysis. By carefully reading the manual, you can find out about these and many other features available to you.

Equipment

To use this program, you need:

- A TRS-80® Color Computer with at least 16K RAM
- Standard Television (Color Recommended)

Optional equipment includes:

- A printer
- Cassette recorder
- Joystick control

Loading Instructions

1. Before inserting or removing a Program Pak® ROM cartridge, make sure your computer is off. Failure to do so could result in damage to the Progr Pak.

2. Connect the Color Computer, television, and optional equipment. See your TRS-80 Color Computer Operation Manual for further details regarding connections.

3. Set the switchbox control to Computer (or Game).

4. Insert the Cyrus Chess Program Pak, label side up, into the slot on the right side of the computer. Press firmly until it engages securely, but do not force it.

5. Turn on the television, and tune it to Channel 3 or 4 (whichever is least a in your area).

6. Turn on the Color Computer.
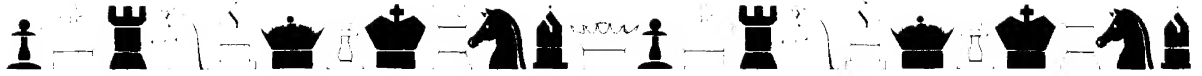
Playing the Game

After you insert the Cyrus Chess Program Pak and turn on the computer, the program title is displayed for a moment. The chessboard then appears with the chess pieces automatically placed in position — White at the bottom of the screen, and Black at the top.

You are now ready to play, but to take full advantage of this versatile program, read the manual before beginning. If you do not know the rules of chess, begin by reading "Appendix A — The Rules of Chess."

The Marker

Inside the square at the bottom left corner of the board is a small pale green square flashing on and off. This is the **marker**, which indicates to the computer the piece you want to move.

Move the marker around the board by using the four arrow keys (⬆, ⬇, ⬅, or ➡). These keys move the marker one square in the direction indicated. If yo hold the key down, the marker keeps on moving until it reaches the end of a row or until you release the key.

You may also control the marker with the joystick (if connected to the LEFT JOYSTICK jack on the back, left side of the computer).

To use the joystick, press J. (See "Commands.") Hold the joystick with the button away from you. When you move the joystick up, down, right, or left, the marker moves one square in the corresponding direction. Return the joystick to its central position to move the marker again. The joystick button performs in the same way as the ENTER key.

To turn off the joystick control, press J again.

Moving

To move a chess piece:

1. Bring the marker onto the square occupied by the piece you want to move.

2. Press ENTER. The piece now starts flashing and responds to directional commands.

3. Use the arrow keys or joystick to move the piece to its new square.

4 Press ENTER again. Your move is complete.

Cyrus starts computing its reply. When it is ready, it beeps and m
on the board. Make your next move by repeating steps 1-4 above.

If you try to move from an unoccupied square or move a piece tha
legal move, an error signal sounds. Similarly, an error signal soun
attempt to move to an illegal square.

If you have taken control of a piece but then decide not to move it
its original square (shown by the marker position), and press (E N
piece is now returned, and the marker may be moved to another pi

Cyrus lets you move first and play White. If you want to play Bla
(See "Commands.") This makes Cyrus move first. To have Black p
board, press (I) to invert the board before the game begins.

Special Moves

To capture an opponent's piece, simply move your piece in the usu
onto the occupied square. The captured piece then "slides off" the

For a Pawn capture en passant, move the attacking Pawn forwar
one square. The captured Pawn slides off the board.

To castle, move the King two squares to the right for a King-side
squares to the left for a Queen-side castle. Press (E N T E R). The l
made automatically.

If you advance your Pawn to the far end of the board, it moves ba
until you tell the computer the piece to which it should be promote
(R), (B), or (N) for Queen, Rook, Bishop, or Knight respectively.
promotes one of its own Pawns, it always promotes it to Queen.

For further discussion of these special moves, turn to Appendix A

Message Display

When the chessboard is displayed, press the space bar to see the message display. The chessboard is replaced by a record of the moves made so far and other messages. The record of moves is displayed using the following system of notation.

	A	B	C	D	E	F	G	H
8	A8	B8	C8	D8	E8	F8	G8	H8
7	A7	B7	C7	D7	E7	F7	G7	H7
6	A6	B6	C6	D6	E6	F6	G6	H6
5	A5	B5	C5	D5	E5	F5	G5	H5
4	A4	B4	C4	D4	E4	F4	G4	H4
3	A3	B3	C3	D3	E3	F3	G3	H3
2	A2	B2	C2	D2	E2	F2	G2	H2
1	A1	B1	C1	D1	E1	F1	G1	H1

In this system, each square has its own unique combination of a letter and number to identify it.

Each file (a vertical column of squares) is represented by a letter betwee
H. Each rank (a horizontal row of squares) is represented by a number I
and 8. Each square is designated by the letter of its file and the numbe
rank, so at the beginning of the game, the white King is on square E1,
Queen is on D8, and so on.

Note: If you choose to press ⒤ to invert the board so that Black pla
board, then the rank and file codes are also inverted.

Here is an example of the opening of a hypothetical game:

1	E2-E4	D7-D5
2	E4XD5	G8-F6
3	F1-B5+	

In this example, White has begun the game by moving the pawn in from
White King forward two squares from E2 to E4. Black replied by movin
Pawn in front of the black Queen forward two squares from D7 to D5.
Pawn then captured the black pawn. (The capture is indicated by an X.)
replied by moving a Knight from G8 to F6. White then moved a Bishop
to B5 to put the black King in check. (Check is indicated by a +.)

White's moves are always listed on the left, Black's on the right. In the
example, you can see that it is Black's turn to move.

Also shown on the message display, above each column of moves, is a h
either CYRUS 09 or PLAYER. If you are playing Black against the compu
CYRUS 09 is displayed on the left and PLAYER is on the right.

Below each heading, Cyrus keeps track of the total amount of time the
take while deciding their moves. It is given in an hours, minutes, and se
format (HH.MM.SS).

Commands

From the message display, press the space bar to see the list of commands available to you. Press the space bar again to see the board.

The commands are:

(A)	Display Analysis
(B)	Take Back Move
(D)	Demonstration Game
(F)	Step Forward (replay move taken back)
(H)	Hint
(I)	Invert Board
(J)	Joystick
(L)	Level Of Play
(M)	Move Immediately / Compute Next Move
(N)	Play Next Best Move
(P)	Engage Or Disengage Printer
(S)	Set Up Position

In "Setup" Mode:

(B)	Add Bishop
(K)	Add King
(M)	Player Moves For Both Sides
(N)	Add Knight
(P)	Add Pawn
(Q)	Add Queen
(R)	Add Rook
(X)	Change From White To Black Or Black To White
(Z)	Zero Clocks
(CLEAR)	Clear Squares
(SHIFT) (L)	Load From Cassette
(SHIFT) (S)	Save On Cassette
(SHIFT) (CLEAR)	Clear Board

(T)	Enter Title
(V)	Velocity
(SHIFT) (R)	Replay Game

(SHIFT) (BREAK)	New Game
(↑)	Move Marker Up
(↓)	Move Marker Down
(←)	Move Marker Left
(→)	Move Marker Right
(SPACE BAR)	Alter Screen Display (Chessboard — Message Display — Instructions)

You can use the command keys from the chessboard display. An explanation of each command follows.

Analysis

If you would like some insight into the program's train of thought, press the (A) key. Press the space bar once to get to the message display, where ANALYSIS ON appears on the screen. If Cyrus has just started thinking, the screen remains unchanged for a few seconds. A sequence of moves then appears underneath the record of the moves made so far. The first move in the sequence is the one Cyrus is thinking of playing next. This is the move assessed as best by its analysis so far. The next move in the sequence is your expected reply, followed by Cyrus's intended reply. The sequence may change as Cyrus investigates the situation further.

To cancel the analysis display, press the (A) key again.

Taking Back Moves

If you make a move but then have second thoughts about it, you can easily take the move back. At the chessboard display, first wait for Cyrus to reply, then press (B), and the program's move is retracted. Press (B) again to retract your own move. You may then retake your move.

By pressing (B) repeatedly or by holding it down, you can take back a whole series of moves by both sides. Notice that if you take back more moves for White than for Black, or vice versa, you swap sides with the computer, playing the side that the computer previously played.

You can take back moves even after the program has displayed checkmate, stalemate, or draw.

Demonstration Game

If you press the (D) key, both White and Black will be played by Cyrus in a demonstration game. To halt the demonstration, press (M). After the next move is made, you can take over the opposing chess pieces.

Step Forward

This is the opposite of taking back moves. Press the (F) key to replay moves that you have taken back using the (B) key.

Hint

If, during your turn, you want Cyrus to suggest a move for you to play, press the (H) key. One of your chess pieces makes a suggested move and then automatically returns to its original position. You decide whether to act on this hint or not.

If you press (H) while Cyrus is computing its move, it moves one of its pieces back and forth showing you the move it assesses as best at the current stage of its analysis.

Invert Board

Press the (I) key if you want to invert the board so that Black is at the bottom and White is at the top.

Press (I) again to invert the board to its original position.

Joystick

Connect the joystick to the LEFT JOYSTICK jack located on the back left side of the computer. To use the joystick, press (J). You can now move pieces by moving the joystick up, down, right, or left. The marker moves one square in the corresponding direction. The joystick button has the same function as the (ENTER) key.

Press (J) again to turn the joystick off.

Change Level

You may instruct Cyrus to play at various levels of skill. Cyrus plays stronger if it has more thinking time per move. These are the approximate lengths of time it takes for a move on each level:

Level	Time
1	2 seconds
2	6 seconds
3	15 seconds
4	30 seconds
5	45 seconds
6	1 minute
7	2 minutes
8	3 minutes
9	3 minutes 30 seconds

There are three additional levels: adaptable, infinite, and problem.

When playing on the adaptable level, Cyrus takes roughly the same amount of time as you to compute its moves. It measures your thinking time over a series of moves, then speeds up or slows down as necessary.

When playing on the infinite level, Cyrus will normally compute until you tell it to move by pressing (M). (See "Move Immediately" below.)

On the problem level, Cyrus searches for a way to force checkmate in five moves or less. (For more details see "Appendix C — Solving Chess Problems.")

When you first turn on the computer, Cyrus is set to play on Level 2. The current level can always be seen on the message display. You may change the level of play any time during your turn to move by pressing the (L) key. Press the key repeatedly or hold it down to see the level changing. When the level that you want is displayed, release the (L) key, and carry on with the game. The program remains at the same level of play during each subsequent game, until you change it or turn off the Color Computer.

Notes: Like a human player, Cyrus normally takes more time in a complicated position than in a relatively simple one. The time it takes for an individual move is sometimes much more than the average for the level.

Cyrus also has knowledge of a large number of standard chess openings At the beginning of a game, it usually moves instantaneously, regardless of its level of play.

Move Immediately / Compute Next Move

Press the (M) key to interrupt Cyrus while it is computing and force it to make its best move according to its analysis at that time.

If it is your turn to move, press (M) to have Cyrus compute your move. Press (M) again to have Cyrus compute its reply or to take over Cyrus's chess pieces.

Next Best Move

After Cyrus makes a move, press the (N) key and this move will be taken back, and, after re-computing, Cyrus plays its next best move. Press (N) again, and the process repeats itself until all the legal moves in the position have been exhausted. (NO MORE MOVES then appears in the message display.)

Activate or Disengage Printer

Cyrus Chess can be used with an optional serial printer. In connecting a printer, pay careful attention to the instructions supplied with it. See "Appendix B — Saving a Game" for instructions on using this feature.

Set Up Position

Use this command and its subset of commands to solve chess problems and to finish or play out published games. See "Appendix C — Solving Chess Problems" for a complete discussion of this feature.

Title

You can type up to a 30-character title (for example, your name and the date) at the top of the message display. If you are using a printer, this heading can be printed together with the game record. (See "Appendix B — Saving a Game" for further instructions on printing the game record.)

Press the (T) key. You can now use the computer keys to type words and numbers in the normal way, except that there are no lowercase letters. Correct errors by using (←) to back up and then typing over the errors. Press (ENTER) when the title is complete.

Velocity

The movements of the marker and pieces on the chessboard display can be fast or slow. (Cyrus begins with the slow speed.) To change the speed, press the ⌊V key. Press ⟨V⟩ again to return to the slow velocity.

Replay the Game

You can sit back and watch all the moves of a game being replayed automatically. This is possible at any time in the game or at its end.

To replay a game, hold down the ⟨S H I F T⟩ key, and without releasing it, pre.
⟨R⟩.

Ending the Game

The game ends when either the Black or White King cannot escape check. Thi: checkmate. The checkmated King flashes on and off and the word, CHECKMATE, appears on the message display.

Similarly, if a game ends in a draw or stalemate, the appropriate message appears on the message display, and one of the Kings begins to flash on and o (See "Appendix A — Rules of Chess" for a discussion of drawn and stalemate games.)

Beginning a New Game

To begin a new game, press the ⟨S H I F T⟩ key, and without releasing it, pres ⟨B R E A K⟩. The chess pieces are reset on the board, and you are ready to beg: again.

# Appendix A
The Rules of Chess

Chessboard

The game of chess is essentially a game between two players who oppose each other on the opposite sides of a chessboard. The object of the game is to capture the opposing player's King. The chessboard consists of 64 squares, colored alternately light and dark (called White and Black), arranged in eight vertical rows called files and eight horizontal rows called ranks. Squares of the same color that crisscross the chessboard are called diagonals.

Chess Pieces

Each player has a set of 16 chess pieces, enough to fill the first two ranks. The first rank is occupied by a King (K) and Queen (Q), two Bishops (B), two Knights (N), and two Rooks (R). The eight men in the second rank are called Pawns (P). The pieces are originally positioned as shown below:
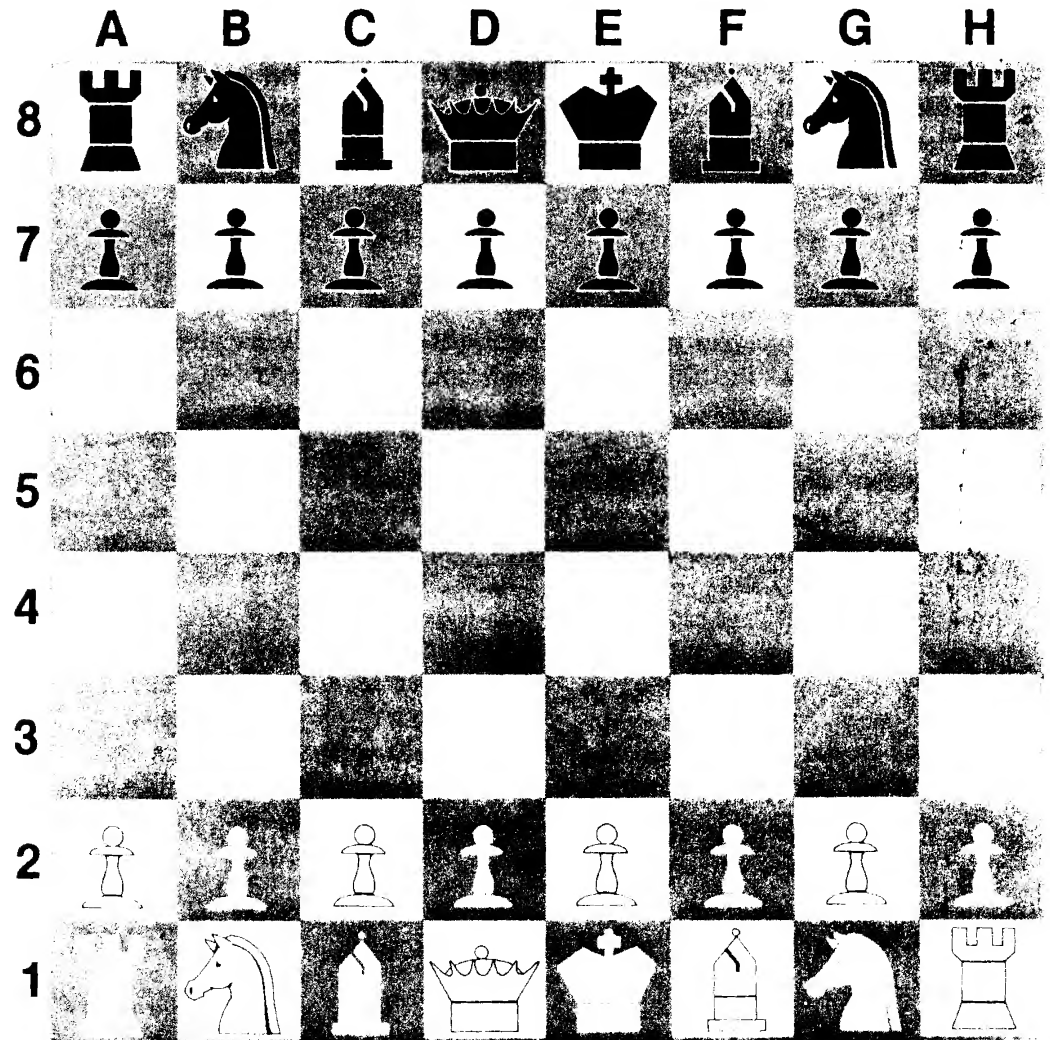
To remember the initial position of the King and Queen, keep in mind that a Queen begins the game on a square of its own color and that a King begins on a square of the opposite color.

Moving Chess Pieces

White always makes the first move of a game. The players take turns moving one piece at a time until the end of the game. Each turn, a player must move one chess piece to a square which is either vacant or occupied by an opponent's piece. In the latter case, the opponent's piece is removed from the board. (For the only case in which a player moves two pieces at once, see "Castling," below.)
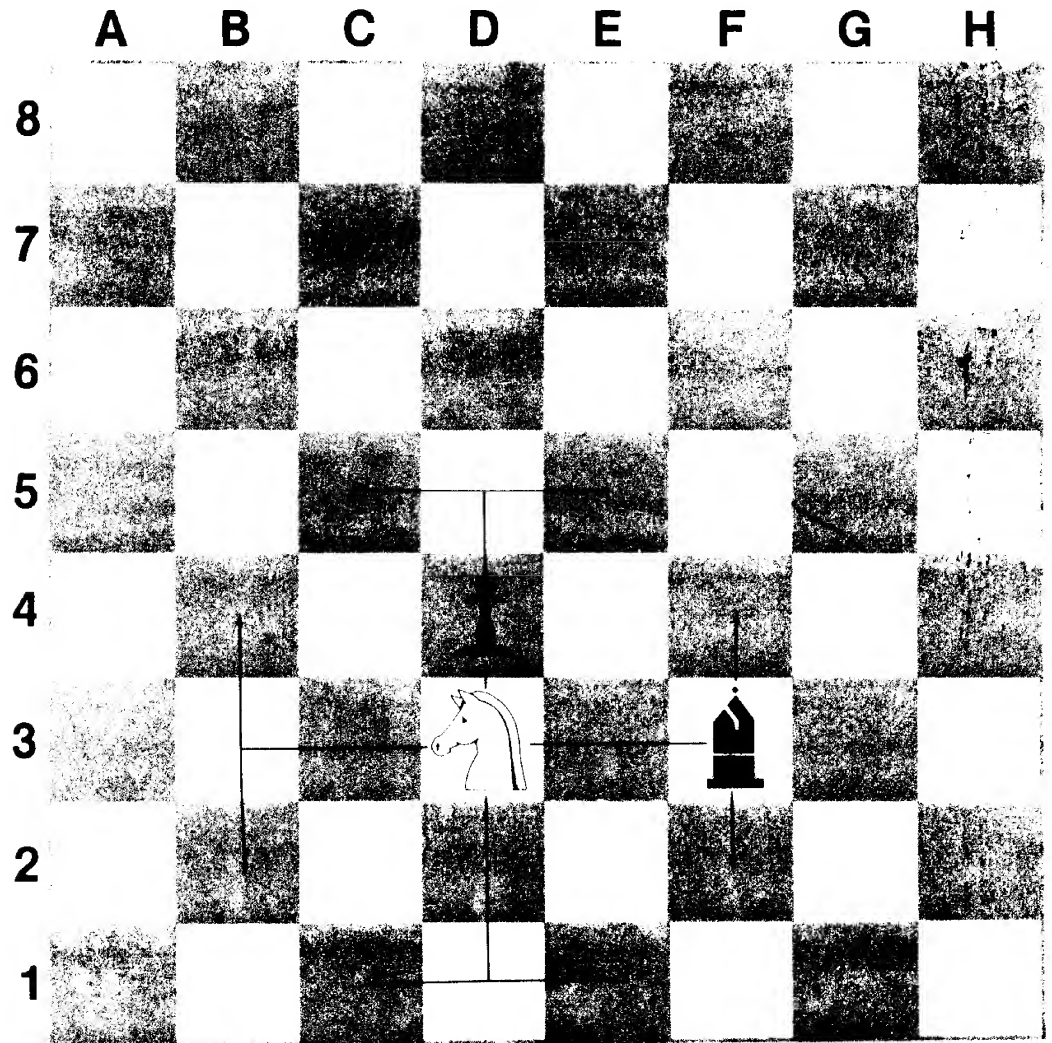
King

Each chess piece has a characteristic way of moving. The King is your most important piece — if it is captured, you lose the game. Though the game revolves around the King, it is your most vulnerable piece, because its moves are extremely limited. You can move the King only one square at a time in any direction — forward, backward, to the right or left, or diagonally. However, you cannot move the King to a square on which it can be attacked by an opposing piece.

Queen

You can move the Queen any number of squares along the rank, file, or diagonal, providing that there is no piece in the way. This makes the Queen your most powerful weapon.

Bishop

You can only move a Bishop diagonally. It never leaves the color of the square on which it begins the game. Your Bishop is most powerful when you position it in the center of the board, from where you command the widest range of territory.

Knight

Move your Knight in an L-shaped leap. You can move it either two squares along a rank and then one square along a file, or two squares along a file and then one square along a rank. It can leap over any other piece, White or Black, in its path.

Rook

You can move a Rook as many squares as you wish in an entire rank or file, providing that there is no piece in the way. You cannot move a Rook diagonally.

Pawn

You can move your Pawn only forward, advancing it on the file when you are not using it to capture a piece. You can move the pawn either one or two squares forward on its first move. Thereafter, you can only move it forward on its file one square at a time.

When a Pawn reaches the far end of the board, you can immediately replace it with a Queen, Rook, Bishop, or Knight of the same color. This is known as Pawn promotion. Since the Queen is the most powerful piece, it is usually chosen. As a result of Pawn promotion, you may have two or more Queens, Rooks, Bishops, or Knights, but only one King.

Capturing Chess Pieces

Use your King, Queen, Bishop, Knight, and Rook to capture an opponent's chess piece by occupying the square of the opposing piece. In the illustration below, the White Queen can capture the Black Pawn by advancing to the Pawn's square; the Pawn is removed from the board. The Black Rook can also capture the White Bishop, and the White Bishop can capture the Black Pawn.

To capture an opposing piece with your Pawn, move the Pawn one square
diagonally forward. A special type of capturing with your Pawn is capture en
passant (in passing). If your opponent moves a Pawn two squares forward on
the Pawn's first move and your Pawn could have captured it had it only been
moved one square forward, you can capture that Pawn en passant on the next
turn.
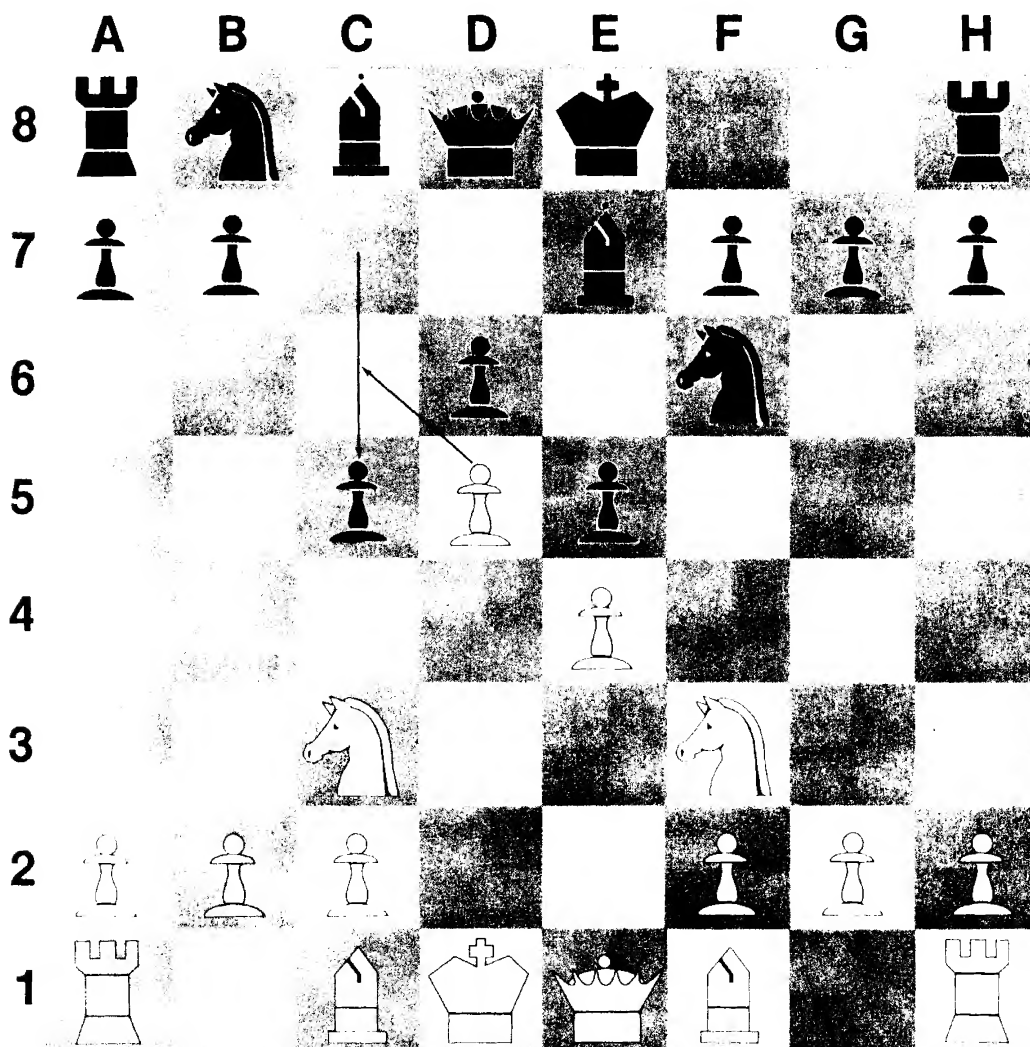
Castling

Castling is a special move that you can make with both your King and Rook. This move essentially helps you do nothing more than gain a better position for your Rook and protect your King. You can castle only once in a game. To castle, move the King two squares toward the Rook, and then move the Rook to the square passed over by the King.

You can castle to either side, providing that:

- You have moved neither the King nor the Rook from its original square

- All the squares between the King and Rook on that rank are empty

- The King is not in check or forced to move through or into check
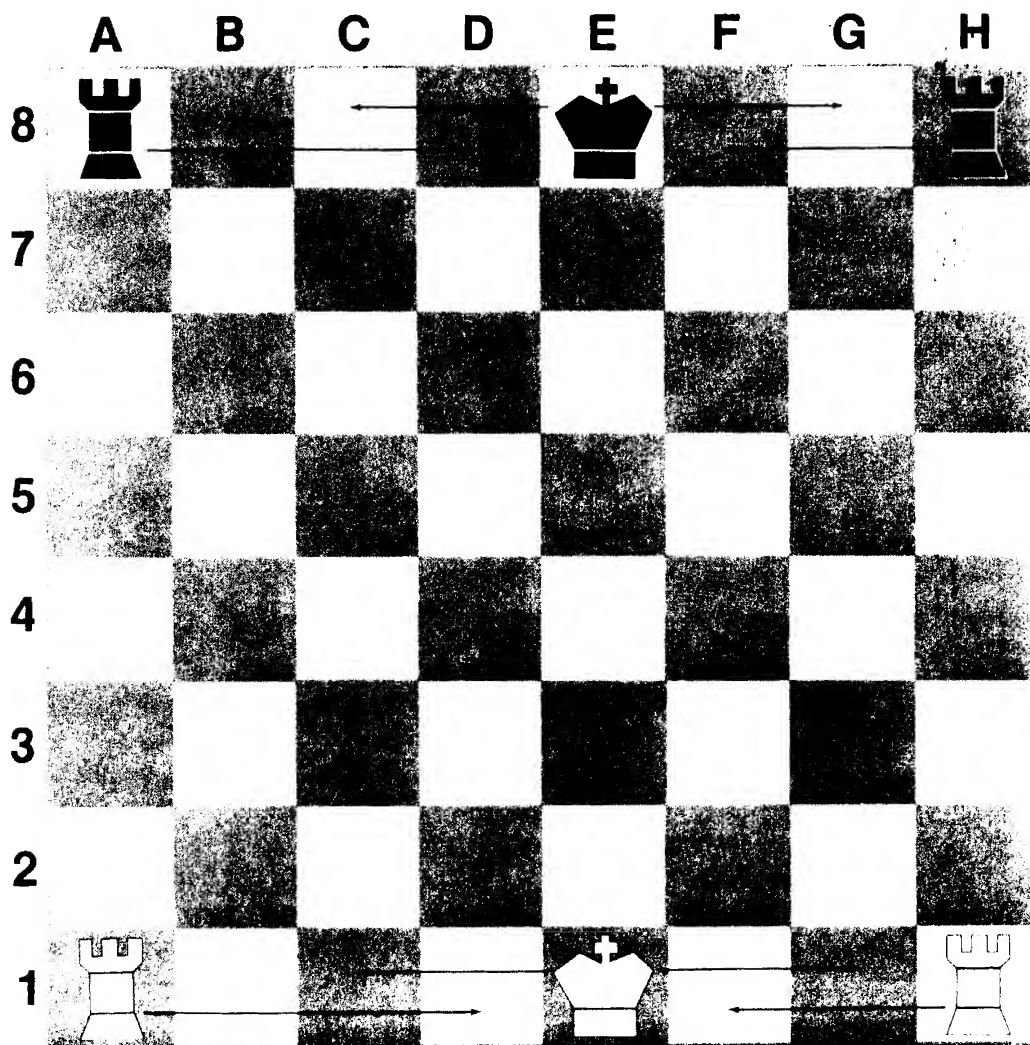
Check and Checkmate

Since the object of play in chess is to capture your opponent's King, you are most successful when you threaten the opposing King with capture. This is called placing a King in check. If your King is in check, you can save it by:

- Moving the King to another, "safe" square

- Capturing the attacker

- Interposing a piece on the line of check

When you cannot escape by one of these methods, you are checkmated, and the game is over.

Stalemate and Other Types of Drawn Games

A game can end in a draw in one of five ways:

- A player cannot make a legal move although the King is not in check (a stalemate)

- Neither White nor Black can checkmate

- The same move is made three consecutive times to the same positions by both players

- During a series of 50 consecutive moves, no capture is made and no Pawn moved

- Both players mutually agree to end the game

Appendix B
Saving a Game

Using a Cassette Recorder

You can save games played with Cyrus 09 Chess on cassette tape and reload them later for replay or analysis.

To save on tape, carefully connect the tape recorder (Radio Shack CCR-81 cassette recorder is recommended) to the computer using the instructions in your TRS-80 Color Computer Operation Manual and the instructions provided with your tape recorder.

To save the game you are playing:

1. Press ⬭S⬭ to enter the setup mode (see Commands).

2. Press the PLAY/RECORD keys on the tape recorder.

3. On the computer keyboard, hold down ⬭SHIFT⬭ and press ⬭S⬭.

   The message display shows SAVING. When the message WHITE or BLACK reappears, the game record has been saved, and you can continue playing the game:

To load a saved game:

1. Press ⬭S⬭ to enter the setup mode.

2. Press the PLAY key on the tape recorder.

3. On the computer keyboard, hold down ⬭SHIFT⬭ and press ⬭L⬭.

While the computer is searching for the data on the tape, the message display shows LOADING S. When the game record is found, the message changes to LOADING F. When loading is complete, the word WHITE or BLACK reappears. The final position in the game you loaded is now displayed on the chessboard. Press ⬭S⬭ to leave the setup mode and you may replay the game, take back moves, or make use of any other feature of the Cyrus 09 program.

If you want to stop the saving or loading process once it has started, press the RESET button on the back of the computer. The program resets the chessboard.

If you try to load invalid data (such as data from another program), the program resets itself automatically.

Using a Printer

You can print a record of the moves made in a game with a properly connected serial printer. When connecting a printer, pay careful attention to the instructions supplied with it. The record of moves is made using the system of notation discussed under "Message Display."

Press the (P) key whenever you want to start printing the moves. The message, PRINTER ON, appears on the message display. As long as the printer remains on, each move prints as soon as it is made.

To print the complete game, with the printer on, hold down the (S H I F T) key. Without releasing it, press (R) to replay the completed game. As each move is replayed, the move also prints.

You can type up to a 30-character title at the top of the message display. This heading prints together with the game record when the printer is activated. (See "Title" for further instructions.)

Disengage the printer by pressing (P) again. The message, PRINTER OFF, appears on the message display.

Note: If you have chosen the option to play Black and to have Cyrus play White, your moves will be printed in the second column. Black's moves are always printed in the second column.

Since the Cyrus program prints column headings before you select whether you want to play White or Black, be sure you don't mistake Cyrus's moves for your own—no matter what the column headings indicate.

Appendix C
Solving Chess Problems

Now and again you may want to see Cyrus solve a chess problem, or you may wish to set up a position from a game that has been published, to see how the program solves it. To set up a particular position on the board, first press ⓢ. SET UP POSITION now appears on the message display to show you that the program is ready to operate in a special mode. A new set of commands can now be viewed by pressing the space bar once from the message display.

As long as the program is in setup mode, you can do the following:

- Clear the entire chessboard by holding down a (S H I F T) key and pressing (C L E A R)

- Clear an individual square by positioning the marker on that square and pressing (C L E A R) (without shift)

- Insert a chess piece on the board by moving the marker onto the desired unoccupied square and pressing the appropriate key: (K) (King), (Q) (Queen), (B) (Bishop), (N) (Knight), (R) (Rook), or (P) (Pawn).

The word WHITE or BLACK appears on the message display. As long as WHITE is displayed, all pieces that you insert on the board will be white. To change to the opposite color press (X).

When you have set up the position of the pieces on the board to your satisfaction, make sure Cyrus knows which side is to move next. If WHITE is displayed on the message display, Cyrus expects that it is White's move. Press (X) to change to the opposite color.

Press ⓢ to take the program out of the setup mode. Play may now proceed.

Here is an example of how a position is set up.
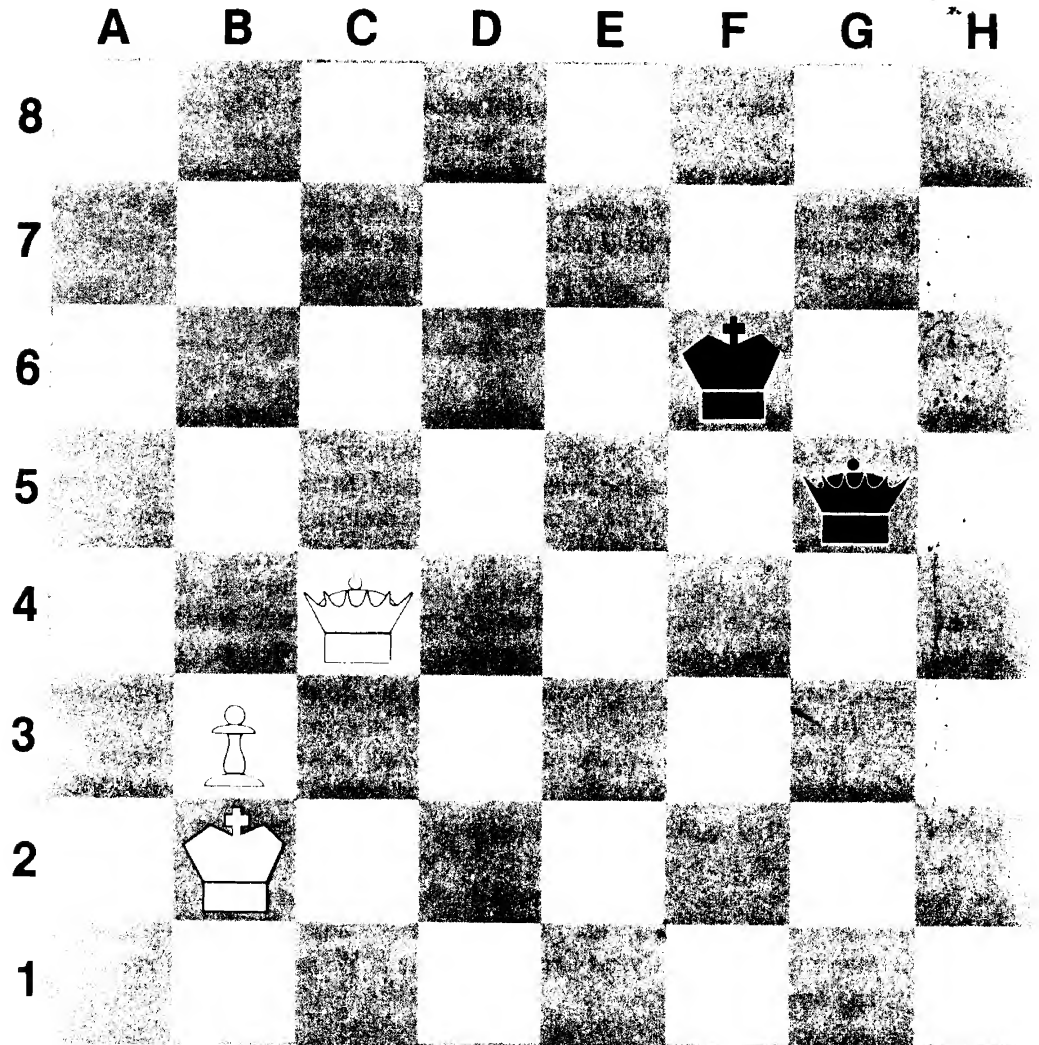
1. Press Ⓢ to enter the setup mode.

2. Press (SHIFT) (CLEAR). The chessboard is cleared.

3. If BLACK is shown on the right side of the message display, press (X). You can now place White pieces on the board.

4. Move the marker onto the square (B2) in which you want the White King to appear.

5. Press (K). A White King appears.

6. Move the marker to the square (B3) in which you want the White Pawn to appear.

7. Press (P). A White Pawn appears.

8. Move the marker to the square (C4) in which you want the White Queen to appear.

9. Press (Q). A White Queen appears.

10. Press (X). You can now place Black pieces on the chessboard.

11. Move the marker to the square (F6) in which you want the Black King to appear.

12. Press (K). A Black King appears.

13. Move the marker to the square (G5) in which you want the Black Queen to appear.

14. Press (Q). A Black Queen appears.

15. Press (X) again. Cyrus now knows that when play continues from this position, it is White's turn to move.

16. Press (S). Play can now begin.

17. Press (M) if you wish Cyrus to calculate the move.

Cyrus recognizes the following positions as illegal.

- No Kings on the board

- One side with two Queens as well as eight Pawns

- Black's King in check and White's turn to move

When you try to escape the setup mode with the board set up in an illegal situation, the message, ILLEGAL, appears on the message display. You cannot escape setup mode until you correct the position.